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Geographic Analysis and Monitoring Program

Land Cover Trends Project

Statement of Problem

Information on the rates, driving forces, and consequences of land use and land cover change is important in studies addressing issues ranging from economic health, the health of aquatic resources, to climate change. Unfortunately, there is a paucity of information on land use and land cover change except at very local levels. This research project has a goal to document the types and rates of land cover change on a region-by-region basis over the past 30 years for the nation, and to determine some of the key drivers and consequences of the changes.

Objectives

The objectives of the study are to: (1) Develop a comprehensive methodology for using sampling and change analysis techniques and Landsat MSS and TM data for measuring regional land cover change; (2) Characterize the types, rates, and temporal variability of change for a 30-year period; (3) Document regional driving forces and consequences of change; and (4) Prepare a national synthesis of land cover change.

Relevance and Impact

Land use and land cover changes occur at all scales, and changes at local scales can have dramatic, cumulative impacts at broader scales. Consequently, land use and land cover changes are not just of concern at local and regional levels (i.e., because of impacts on land management practices, economic health and sustainability, and social processes), but globally as well. The challenge facing policy-makers and scientists is that there is generally a lack of comprehensive data on the types and rates of land use and land cover changes, and even less systematic evidence on the causes and consequences of the changes. Lack of local and regional data of sufficient reliability and temporal and geographic detail frustrates attempts at fine-tuned assessments of the implications of such changes.

Strategy and Approach

The estimates of rates, driving forces, and consequences of land cover change are being developed using probability sampling within an ecoregion framework. A sample of 10 km by 10 km blocks has been selected for each of the nation's ecoregions. The sample provides estimates of change with less than a 1.0% margin of error at the 85% confidence level. The analysis of change is based on the interpretation of five dates of Landsat MSS and TM data (nominally 1973, 1980, 1986, 1992, and 2000). The analysis of ecoregions (see below) shows the significant uniqueness and variability of the geographic characteristics of land cover change. The information contributes to the assessment of the impacts of land cover change, provides a basis for improved predictions of future changes, and consequently, may lead to improved policies for regional management of environmental resources.

For More Information

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